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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/839,209 | 04/23/2001 | Katsunori Tanaka | Q63408 | 3746 |

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SUGHRUE, MION, ZINN, MACPEAK & SEAS
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Washington, DC 20037

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| EXAMINER |
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NGUYEN, TRAN N

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| ART UNIT | PAPER NUMBER |
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2834

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary**Application No.**

09/839,209

Applicant(s)

TANAKA ET AL.

Examiner

Tran N. Nguyen

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 20 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-3 and 7-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-3, and 7-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 20 March 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

The corrected or substitute drawings were received on 3/20/03. These drawings are approved by the Examiner of the record.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. **Claims 1 and 10** are rejected under 35 U.S.C. 112, *first paragraph*, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1's and 10's recitation "*wherein said permanent magnets are supported by corrosion-resistive holding members surrounding said permanent magnets, wherein at least one portion of a side opposing to the pawl-shaped magnetic pole side surface of said magnets is resin coated*" contains subject matter which was not described in the specification in such a way to convey that the inventors had possession of the claimed invention.

surrounded, surrounding, surrounds (verb)

1. To extend on all sides of simultaneously; encircle.
2. To enclose or confine on all sides so as to bar escape or outside communication.¹

¹ The American Heritage® Dictionary of the English Language, Third Edition copyright © 1992 by Houghton Mifflin Company. Electronic version licensed from INSO Corporation; further reproduction and distribution restricted in accordance with the Copyright Law of the United States. All rights reserved.

Thus, The term "surrounding" means *to extend on all sides of simultaneously; encircle, or to enclose or confine on all sides*. Therefore, the above recitation is understood as the corrosion-resistive holding members surrounding all four sides of the permanent magnets. Regarding the claimed language "*wherein at least one portion of the side that is opposing to the pawl-shaped magnetic pole side surface of said magnets is resin coated*", it is understood that resin-coated layer on the at-least-one portion of the magnet's side can be inner layer with respect to the surrounding holding member or the resin-coated layer can cover not only magnet's side portion but also the corresponding portion of the surrounding holding member thereof. Based on this interpretation of the claimed language, the features of the claimed language are not described in the specification.

The spec, page 9, discloses the **holding member (41) having a U-shaped bent portion (42)**, within with the magnets (30) are attached so that each magnet is surrounded by the bent portion (42). Because the spec discloses that the holding member having bent portion of U-shaped, which has three sides, the phrase "*each magnet is surrounded by the bent portion (42)*", as described in the spec, is understood as the magnet being surrounded around three sides. The spec, page 10 and fig 9, furthers discloses that resin (45) is filled between the side surfaces of the pawl poles (23) and the magnet's side opposing to the pawl-shaped magnetic pole side surface. As shown by fig 9, the magnet's side opposing to the pawl-shaped magnetic pole side surface is not surrounded by the holding member, or specifically by the holding member's U-shaped bent portion.

Thus, the claimed language of claims 1 and 10 is not disclosed and supported by the spec of the present invention in such a way that to convey to artisans that the inventors had possession of the claimed invention.

Claims 1-10 are rejected under 35 U.S.C. 112, **second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1's and 10's recitation "*wherein said permanent magnets are supported by corrosion-resistive holding members surrounding said permanent magnets, wherein at least one portion of*

a side opposing to the pawl-shaped magnetic pole side surface of said magnets is resin coated" is indefinite because it is unclear what is structural relationship the resin-coated (layer) and the holding member with respect to the magnet. In other words, because of the recitation that the holding member surrounding the magnet, it is unclear whether the resin-coating on the one portion of the magnet's side being inner resin coating layer with respect to the surrounding holding member or the resin-coated layer can cover not only magnet's side portion but also the corresponding portion of the surrounding holding member thereof.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 7-9 and 10, as recited in the present claimed language**, are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior-Art figure 12, (hereafter **AAPA fig 12**) in view of **Iwata** (US 5800728), **Mukai** et al (US 5903083), **Harris** et al (US 5973143) and **Akiyoshi** et al (JP 40-5211741, pubn-date 8/20/92).

Regarding claim 1 and 10, according to the present application's Background of the Invention, pages 1-2, the AAPA fig 12 is a sectional side view of a conventional, i.e., prior-art, alternator comprising:

a stator (8) being disposed within brackets (1, 2) having exhaust windows (17);

a rotor having rotor coil (13) for generating a magnetic flux, a pole core having first and second pole members (21, 22), each is provided with pawl-shaped magnetic poles (23, 24) projecting in a intermeshed relationship to cover the rotor coil;

a plurality of permanent magnets (PMs) disposed in between the pawl poles;

a fan (5) mounted to each of opposite axial ends of the rotor for cooling therein;

The AIPA fig 2 substantially discloses the claimed invention, except for the following:

(a) *the permanent magnets (PMs) are of samarium-iron alloy containing titanium (Ti) and Boron (B) and are independently attached to each of the rotor pawl-poles;*

(b) *the stator is a three-phase winding;*

(c) *the permanent magnets are supported by corrosion-resistive holding members surrounding said permanent magnets, and are independently attached to each of the rotor pawl-poles;*

(d) *at least one portion of a side opposing to the pawl-shaped magnetic pole side surface of said magnets is resin coated;*

Regarding limitations of subsection (a), Iwata teaches a PM is of samarium-iron alloy containing titanium (Ti) and Boron (B). Iwata discloses that the composition of the permanent magnet of samarium-iron alloy containing titanium and boron would have superior magnetic characteristics.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the Mukai's rotor by selecting PM material composition of samarium-iron alloy containing titanium and boron, as taught by Iwata. Doing so would enable to improve efficiency of the alternator due to rotor having magnets with superior magnetic characteristics. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding limitations of subsections (b), Mukai teaches an alternator having stator is provided with three-phase winding. Those skilled in the art would realize that three-phase winding in the alternator's stator is the most efficient winding configuration for the alternator,

particularly vehicle alternator. The Examiner takes Official Notice that alternators having stators with three phase windings are well known in the art.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the AAPA's alternator by providing the stator with three-phase winding, as taught by Mukai. Doing so would enhance the efficiency of the alternator. Furthermore, doing so would require only routine skills in the art since alternators having three-phase are well known in the art.

Regarding limitations of subsections (c), Harris, however, teaches a rotor having a plurality of PMs (38), each of which is surrounded by a corrosion-resistive holding member (36) for securely holding the PMs in place and protecting the PMs against corrosion, wherein each magnet, and the corresponding holding member, being independently secured to the pawl-pole. The holding member (36) having four sides surrounding four sides of the magnet. By completely surrounding and sealed the PMs (38) therein, the holding member fully enclosing the PMs and protecting them from corrosion (col 2 lines 42-55) while independently being secured therein the magnet and the corresponding holding member can be easily maintained or replaced.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the rotor by embodying the PMs with corrosion-resistive holding member, wherein each magnet, and the corresponding holding member, being independently secured to the pawl-pole, as taught by Harris. Doing so would provide means for securely holding the PMs in place and protecting the PMs against corrosion and independently being secured there in the magnet and the corresponding holding member can be easily maintained or replaced.

Regarding limitations of subsections (d), Akiyoshi, however, teaching the PM (6) is resin coated, specifically the resin coating (7) serves as a bonding agent to attached the PM to the rotor core (5). Those skilled in the art would understand that the important teaching of the AKiyoshi ref is to affix PMs to the accommodating component with resin. Resin is a well know bonding agent which is commonly used as adhesive material to attach structural components without additional fastening parts that would not only increase in part counts of the rotor assembly but also may interfere with the magnetic circuit therein. Furthermore, resin is a corrosion resistant material. Therefore, coating the PMs with the resin would have additional advantage of preventing the PMs from oxidation.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to apply the Akiyoshi's teaching by providing a coat of resin affixing the PMs onto the pawl pole side surface. Doing so would not only provide simple fastening means between the PMs and the pawl poles but also prevents corrosion for the PMs since resin is a corrosion resistant material.

Regarding limitations of claims 7 and 9, Mukai, however, teaches an alternator having a rotor with PMs are disposed on both sides of the pawl poles (fig 7), wherein the rotor poles are restrained by an outer circumference restricting means (32, fig 7) for restricting the displacement of the magnetic poles in the radial direction due to centrifugal force. Furthermore, Mukai teaches that the material for the restricting means can be selected from nonmagnetic material such as stainless steel or resinous material (col 3 lines 1-3). Those skilled in the art would realize that stainless steel and resinous materials are not only known for their high tensile strength but also known for their oxidation-resistant characteristics, i.e., stainless steel and resin do not get rust. Hence, the Mukai's restricting means would have a high structural reliability with long lasting service life without any potential damage due to oxidation.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the AAPA's alternator by embodying the outer circumference restricting means, as taught by Mukai, in the on the outer circumference thereof. Doing so would ensure the abutment between the PMs and the pawl poles as well as provide non-corrosive highly reliable restricting means to restrain the components from radially displacement due to centrifugal force during rotor rotation.

Regarding limitations of claim 8, amended claimed language recites that the restricting means is *only disposed in the vicinity of the tips of the pawl poles*. Mukai teaches the restricting means is *disposed in the vicinity of the tips of the pawl poles* along with several restricting means are provided at equal intervals from the tip to the root of the pawl poles. Those skills in the art would realize that the Mukai's essential teaching is that to provide outer circumferential restricting means to restrains the PMs and pawl poles from radially displacement. Thus, it would have been obvious to an artisan to apply the Mukai's important teaching of providing the restricting means for the rotor. Based upon size and weight of the rotor, an artisan can determined whether providing the restricting means only in the vicinity of the pole's tip or at any predetermined interval of length from the tip to the root of the pole is a matter of obvious engineering design choice, which obviously do not depart from the Mukai's teaching.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the AAPA's alternator by disposing the restricting means only in the vicinity of the tips of the pawl poles. Doing so would be an obvious engineering design choice based upon size and weight of the rotor, as well as a particular industrial application thereof, and it would be an application of the Mukai teaching of providing restricting means in the vicinity of the tips of the pawl poles, along with other equally interval spaced areas of the pawl pole, for preventing radially displacement.

3. **Claims 2-3** are rejected under 35 U.S.C. 103(a) as being unpatentable over **AAPA Mukai, and Iwata, Harris and Akiyoshi**, as applied in the rejection against the base claim, and further in view of **Nagayama et al (US 5779453)**.

The combination of the above listed prior art substantially discloses the claimed invention, except for the added limitations of the following:

- (a) the PMs are magnet powder bonded by resin, as in claim 2;
- (b) the PMs are bonded magnets of Sm sub. 8.2, Fe sub. 75.6, Ti sub. 2.3, Boron sub. 0.9 and N sub. 13, as in claim 3.

Regarding limitations in subsection (4a), Nagayama, teaches a rotor magnets (5a, 5b) that are magnet powder bonded by resin. Nagayama teaches that the magnet powder bonded by resin would prevent eddy current being generated in the PM resulting in reducing heat in the rotor.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the rotor of the alternator by selecting PM of magnet powder bonded by resin, as taught by Nagayama. Doing so would prevent eddy current being generated in the PM resulting in reducing heat in the rotor. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding limitations in subsection (4b), Iwata discloses a samarium-iron alloy containing titanium (Ti) and Boron (B) as well as Nitrogen (N). Iwata does not disclose the specific composition formula as recited in claim 3. However, those skilled in the art would understand that Iwata generally discloses the PM composition for producing high magnetic characteristics. It would have been obvious to an artisan to apply the Iwata's teaching of magnet material composed of Sm Fe Ti B N with specific material composition as in claim 3.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to select bonded PMs of material composition: Sm sub. 8.2, Fe sub. 75.6, Ti sub. 2.3, Boron sub. 0.9 and N sub. 13. Doing so would require only routine skill in the art to select a suitable material for the intended use of the component. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

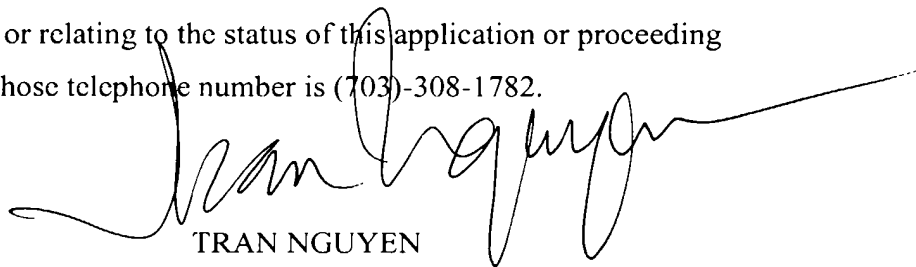
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N Nguyen whose telephone number is (703) 308-1639. The examiner can normally be reached on M-F 6:00AM-2:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703)-308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)-395-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-1782.



TRAN NGUYEN

PRIMARY PATENT EXAMINER

TC-2800